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ABSTRACT

The document contains the evaluation report on the Gifted Science Project in Montgomery County, Maryland, a program to identify resources for students in grades 3-8 who are motivated in science. The Project's primary product is a Project Resource File (PRF) listing people, places, and published materials that can be used by individual students. An introductory chapter provides a general overview, and descriptions of the Project Resource File, evaluation objectives, the sample population, and evaluation instruments and methodology. Chapter II notes that results of the utilization study indicate the PRF offered students possibilities not previously available. Subsequent chapters cover recommendations for program revisions, PRF revisions, development of instructional and enrichment objectives, cost analysis, and a program summary. Tables, additional information and sample forms make up at least half the document. (SW)

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MONTGOMERY COUNTY PUBLIC SCHOOLS
Rockville, Maryland

EVALUATION REPORT ON THE GIFTED SCIENCE PROJECT

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August 1, 1980

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I. INTRODUCTION

A. GENERAL OVERVIEW

The Gifted Science Project (GSP) was federally funded under the Elementary and Secondary Education Act (ESEA), Title IV-C, for the identification of resources for individual gifted students in Grades 3-8. The project was funded for 3 years. During the first year, 1977-78, the staff collected, organized, and classified science resources. An evaluation plan was developed, and reports were designed to collect information on the effectiveness of the project. During the second year, 1978-79, the project was implemented on a trial basis in 15 public schools and 1 Catholic school, and data were collected on its use. At the conclusion of the third year of the project, 1979-80, project materials were revised and prepared for countywide implementation. The results of the evaluation effort were analyzed, and they form the basis of this report.

B. PROJECT RESOURCE FILE

The primary product of the Gifted Science Project is a microfiche file (the Project Resource File, or PRF), listing people, places, and published materials that can be used by individual gifted students. The PRF was designed to support the Program of Studies of the Montgomery County Public Schools (MCPS). The resources in the PRF are indexed as follows:

GRADE LEVEL	3 through 8
TOPIC	Energy Lab Skills - Nature of Science Living Things Living Things - Environment Matter Universe in Change
CATEGORY (see appendix A for definitions)	Activities Awards and Competitions Career Information Courses, Lectures, and Seminars Libraries Mentors Project Ideas Science Processes Visits

C. EVALUATION OBJECTIVES

Two sets of objectives were included in the grant proposal: developmental and evaluative (see appendix B). The developmental objectives delineated the specific activities that would be conducted to produce the PRF and implement the project in the schools. The evaluative objectives detailed the activities that would be carried out to assess the products and services developed during the course of the project. Eight evaluation reports were designed to collect data to meet these evaluation objectives. These reports are shown in appendix C. A table showing the correlation of these reports with objectives is shown in appendix D.

D. DESCRIPTION OF SAMPLE POPULATION

1. Tryout Schools

Sixteen schools participated in the GSP tryout. Fifteen were Montgomery County public schools, and one was a local Catholic school.

County schools were chosen by each area administrative office, using the following criteria:

1. Two elementary schools and one junior high school would be chosen from each administrative area.

2. Schools would remain open throughout the 1979 and 1980 school years.

3. Schools would be using the Science Instructional System (SIS), an objectives-based program being developed within MCPS for Grades K-8.

All the county schools chosen to participate in the project met the first two criteria. All but two of the schools met the third criterion, and these two were selected because of special science and gifted programs that had been implemented. Though these two schools were not part of the SIS, they were provided with the SIS materials and given an orientation session.

The one Catholic school that participated in the project was chosen through negotiations with the Archdiocese of Washington after letters of invitation to join the Gifted Science Project had been sent to independent and Catholic school organizations.

In February 1979 an in-service training session was held for the principal, media specialist, and at least one teacher of each tryout school. At this meeting, the first edition of the PRF (still under development) and an in-service manual were distributed. These materials remained in the schools on a pilot basis for the rest of the 1978-79

school year. The project staff offered to assist the schools in their use of the materials; however, only limited use was made of the PRF, as a result of its late introduction. Although use was limited, a number of revisions were made to both the PRF and the in-service manual, based on feedback from teachers who had used the file and the experiences of the project staff. These revised materials were prepared for use in the tryout period (October 1, 1979 to January 31, 1980) on which this report is based.

Because of the limited use of the file during its introduction in spring 1979, the offer of project staff to help schools was reaffirmed in fall 1979 and accompanied by a list of specific tasks that the staff would do. These included interviewing students, completing reports, and making arrangements with resource persons and parents. This offer was followed up by individual contacts, and all but one of the schools accepted. As a result, GSP staff went to 15 schools and performed one or more of the duties described above. The use of the PRF described in this report is based largely on arrangements made by GSP staff. There were instances, however, where teachers did use the PRF and arrange for student use of resources; and these are also cited in this report.

2. Students

The students who participated in the project were selected by the principal and teachers of each tryout school. Schools were asked to follow the guidelines for identifying the gifted and talented specified by Montgomery County Public Schools (see appendix E). The actual procedures used, however, varied with each school, since these guidelines had not been fully implemented in the county. Some schools attempted to identify each gifted student in Grades 3-8, others chose only one class or grade with which to start, and others selected only one or two students. Evaluation information on this selection process was not collected. According to estimates from the area specialists for gifted and talented, there are approximately 1,100 gifted students in Grades 3-8 in the 15 county schools.

Because of the different approaches to selection and the varying numbers of participating students in each school, no comparisons between schools were planned as part of this evaluation. All the analyses in this report are based on the total number of students who used the PRF, regardless of school.

As described above, the GSP staff helped 15 of the tryout schools in a number of ways. They interviewed students at all the schools--a total of 214 students, ranging from 1 to 48 at a school. For each student, GSP staff selected 5 resources from the PRF and completed Teacher Notes

Report No. 1 (see appendix C). In some cases, they returned the materials to the teacher, who then chose the resources to be used and arranged for their use. If staff help was requested, the GSP staff again talked with the student to determine which resource(s) he/she was interested in and then arranged for the student to use the resource(s). Two teachers selected resources on their own and arranged for their use by students.

Information received indicated that 114 students were to have used at least 1 resource during the tryout period. Of these, feedback reports verified that 103 (46 girls and 57 boys) had used a resource. Attempts to obtain feedback information on the remaining 11 students were unsuccessful; it is not known whether they used a resource.

3. Teachers

There were 131 teachers teaching Grades 3-8 during the tryout period in the 16 tryout schools. They were requested to complete a Teacher Feedback Report No. 3 (see appendix C) for each student use of a resource. Whether or not they had a student who had used the PRF, all the teachers were requested to complete a Summary Comments Report No. 5 (see appendix C).

4. Media Specialists

The media specialists in the 15 county schools provided information by filling out Media Specialist Feedback Report No. 6 (see appendix C). The Catholic school was not asked to complete this report, since it did not have a person in this position.

5. Resource Persons

A resource person is one who was in a position to have one-to-one contact with a student. The categories Activities, Awards and Competitions, and Mentors include resource persons. Other categories either include contact persons who do not work one-to-one with the student (Courses, Lectures, and Seminars; Libraries) or include both persons and other types of resources (e.g., Visits includes both persons and places). For consistency in the analyses to follow, only persons listed under the categories of Activities, Awards and Competitions, and Mentors are considered resource persons. These were asked to complete a Resource Person Feedback Report No. 8 (see appendix C) for each student with whom they worked.

There are 91 resource persons listed in the PRF; 30 are women, 5 are black, and 3 are members of other minority groups. Most of these resource persons completed a Resource Survey Report No. 7 (see appendix C) to indicate whether they had helped a student prior to the tryout (see discussion in section E.8).

E. DESCRIPTION OF EVALUATION INSTRUMENTS AND METHODOLOGY

1. The Student Envelope

The Student Envelope provided a place where all information concerning a single student could be kept. Thirty envelopes were delivered to each school, each one containing 5 Teacher Notes Report No. 1, 1 Prior Experiences Report No. 2 (see appendix C), a Teacher Checklist, and 5 interoffice mail envelopes for returning reports to the GSP office. The Teacher Checklist told the teacher how to arrange for a student to use a resource and how to fill out the required reports. The reports themselves are explained in more detail in the following paragraphs.

2. Teacher Notes Report No. 1

Report No. 1 (see appendix C) was developed to obtain preliminary information on usage and to help teachers keep records of each resource use. This report has six parts: information identifying the student, teacher, and school; information on the resource; space for notes about the contact with the resource; information on the use of the resource; expected dates of use; and person working with the student. This report has a duplicate sheet and a carbon and includes directions for one copy to be sent to the GSP office after the use of a resource has been arranged.

3. Prior Experiences Report No. 2

Report No. 2 (see appendix C) was designed to obtain information on the use of similar resources by students during the year prior to the project tryout. Teachers were instructed to interview each student, determine the number of experiences the student had had in each resource category, and provide a short description of the experience(s). This report was to be completed only once for each participating student. During the initial phase of the data collection, it was decided that information from the report was not useful for comparing a student's prior experiences with his/her experiences during the project tryout. This comparison was made by using the Student Feedback Report No. 4 (see description in section E.5).

4. Teacher Feedback Report No. 3

Report No. 3 (see appendix C) was sent to each teacher of a student who had used a resource in a category other than Activities, Awards and Competitions, or Mentors. Information from part 5 of Report No. 1 was used to determine the time when Report No. 3 would be sent. This report was used to request information on the type of experience the student had had with that resource, any perceived change in the attitude of the student toward science, any difficulties the student may have encountered,

and any additional comments the teacher wished to make. A separate report was sent for each resource used by a student.

5. Student Feedback Report No. 4

Report No. 4 (see appendix C) was sent to each student for whom a Teacher Notes Report No. 1 had been received during the tryout period. A separate Report No. 4 was sent for each resource used by that student. There are three parts to the report. The first is a series of questions about the science resource, which can be answered Yes, No, or Not Sure; the second part consists of a Likert-type scale referring to the student's use of the science resource; and the third has space for the student to elaborate on his/her experience with that resource. This report was sent to students through their teachers and was returned to the GSP office by those teachers.

6. Summary Comments Report No. 5

Report No. 5 (see appendix C) was sent to each teacher in Grades 3-6 in the elementary tryout schools and to each science teacher of Grades 7 and 8 in the junior high tryout schools. This report was sent after the project tryout had been completed. It consists of three parts: the first establishes whether the teacher has used the PRF, the second requests information (on a Likert-type scale) about the teacher's satisfaction with the services of the project, and the third requests information on the teacher's satisfaction with the organization of the PRF, a list of positive aspects of the project, and concerns or suggestions for improving the project.

7. Media Specialist Report No. 6

Report No. 6 (see appendix C) combines both record-keeping and evaluation in one report. The first part has space for media specialists to keep a log of the use of all Student Envelopes. This was intended to serve as a record of where the Student Envelope was at all times. The second part of the report provides space for recommending revisions or deletions to the PRF, and the third provides space for listing desired additions to the school's collection of published materials, based on use of the PRF. The last part contains requests for additional information based on the experience media specialists had with the PRF. This report was to be completed after the tryout by the media specialists of all but the Catholic school, which had no one in this position.

8. Resource Survey Report No. 7

Report No. 7 (see appendix C) was sent to selected resource persons during summer 1979 to determine their involvement with students in the 16 tryout schools during the 1978 calendar year. They were specifically asked if they had provided help in science and, if so, how many students they had worked with. The resource persons selected to receive Resource Survey Report No. 7 were those in a position to work directly with a student rather than identifying another person to work with a student (e.g., the personnel director of an agency might arrange for a scientist to work with a student).

Hindsight leads the project staff to believe that this survey should have been sent to each resource person. Since only a few persons were left out, however, this omission will probably not make a substantial difference in the validity of the utilization study to be discussed below. In addition, only the surveys of resource persons who were listed in the categories Activities, Awards and Competitions, and Mentors were used for this analysis.

9. Resource Person Feedback Report No. 8

Report No. 8 (see appendix C) was sent to each resource person who, according to the information received on Report No. 1, either had worked with a student or had had an appointment arranged before the end of the tryout. This report is analogous to Teacher Feedback Report No. 3 and contains the same information with a few additions. Questions are included on how the student communicated with the resource person, the total amount of time spent with the student, and whether the resource person felt adequately informed about the project or had additional comments to make.

10. Informal Principal Survey

After the tryout period was completed, principals were interviewed by means of an informal principal survey. This survey was designed after the tryout to collect information from principals. Five questions were posed to all principals to obtain their comments, criticisms, and suggestions concerning the project. These are as follows:

1. Can you think of any problems with the project that relate to your role as a school administrator?

2. Have you received any responses from your community about the project (positive or negative)?

3. Do you feel that this resource has helped you to meet the needs of your gifted students?

4. Do you feel you were kept adequately informed on the project?

5. Do you have any suggestions for improving the materials or services received from the project?

II. ASSESSMENT OF PROGRAM EFFECTIVENESS

A. UTILIZATION STUDY (Evaluation Objectives 10-11)

1. Utilization of Resources Prior to the Project

a. Resource Persons

Information on the use of resource persons in the PRF prior to the tryout period was collected through Resource Survey Report No. 7, described previously. Seventy-eight of the 91 resource persons in the PRF were surveyed. The results indicated that 5 (6 percent) during the 1978 calendar year had provided services to students in 1 or more of the tryout schools. When these 5 were asked how many students they had helped, the number ranged from 1 student to 6 (responses were 6, 1, 2, 2, and Not Sure). Four (5 percent) of the remaining scientists were uncertain whether they had helped students, and the remaining 69 (89 percent) reported that they had not.

Students who used resource persons during the project tryout were asked if they had used a similar resource on their own during the previous school year. Of the students using resource persons only one reported a similar experience in the year prior to the project.

b. Published Materials

Data on the use of published materials by gifted students in the tryout schools during the year prior to the tryout are not available. A survey of the use of materials listed in the PRF would not exclude the possibility that students could acquire the materials either in or outside of school; nor would it be possible to obtain from school librarians utilization data that separated the use of materials by gifted students from their use by other students. Though no information of this type is available, there is information from students who used resources listed in the PRF during the tryout period. Of the students using resources listed under the categories Career Information, Project Ideas, and

Science Processes, only 6 students reported using a similar resource on their own during the year prior to the tryout. All 6 of these uses were in the Project Ideas category (see table I).

c. Other Resources

Just as no information is available on the previous use of published materials, there also is none on the use of facilities listed in the following categories: Courses, Lectures, and Seminars; Libraries; and Visits. Of the students who used resources listed under the two categories Visits and Courses, Lectures, and Seminars, none reported having used a similar resource during the previous school year. (No library resources were used during the tryout.)

2. Uses of Resources During the Project Tryout

The use of resources during the project tryout period is based on feedback received from 103 students. The number of different resources used during the tryout can be seen in table II. The use ranged from none of the total resources available in the two categories Awards and Competitions and Libraries to 33 (37 percent) in the category Mentors.[1]

The total number of resources used is larger than the number of different resources used, since many people, places, and published materials were used by more than one student. The total number of resources used is shown by category in table I. The number of uses ranged from none in the categories Awards and Competitions and Libraries to 56 in the category Mentors.

3. Comparison of Use Prior to and During the Project Tryout

Any comparison of the resources used during the year prior to the project and the tryout period needs to take into account the difference in time periods. Both resource persons and students were asked to state previous use of similar resources for the full year prior to the project. The tryout period, however, was only 4 months long. To make the data comparable with the 4-month tryout period all prior experience data were adjusted to reflect a 4-month period.

Tables I and III provide a comparison of uses of resources prior to and during the project tryout. As can be seen in table I, the increase in the number of total resources used (as reported by students) is very large in every category except two, Awards and Competitions and Libraries. No use was made of these during the project tryout; hence no information is available on prior use. The data in table III are based on information

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1. Although not a direct result of the use of the PRF, 72 out of 174 (41%) junior high students registered in the 1980 Montgomery Area Science Fair were from GSP tryout schools.

received from 78 resource persons who completed Resource Survey Report No. 7. Of the 78, 5 (or an adjusted number of 1.67) reported working with students prior to the project, and 31 reported working with them during the tryout. This represents a 1,756 percent increase in use of these persons.

In collecting information on the use of resources, two additional questions were asked of resource persons. The first was how the resource person had communicated with the student, and the second was how much time he/she spent with the student. Results of these questions are shown in table IV. As can be seen, the majority of resource persons reported that the student visited them at work. The next most frequent mode of communication was telephone. (Almost all the scientists who reported communicating by telephone also visited with the student.) The average time spent with a student ranged from 2.2 hours in the category Activities to 3.8 hours in the category Mentors. This figure is probably low, since in many cases scientists completed feedback forms while they were still meeting with students, and their estimates were therefore only of the time they had already spent.

4. Interpretation

The figures reported above show that students used more resources of the kind listed in the PRF during the project tryout than they had used during the year before. When confronted with the question of whether students would have used such resources without the project, we conclude, on the basis of the kinds of resources students reported having used the year before, that such opportunities would not have been available to the same degree and that students would not have used them to this extent.

The percentage of resources used in all categories is somewhat low and is probably due to the unavailability of certain books in school libraries and the limited number of topics in which students were interested. Considering the number of students using resources during the tryout (103 students), one could not expect all of the resources listed in the PRF (321) to be used. It is certainly preferable to have more resources listed than would be used rather than an insufficient number.

5. Summary

The use of certain kinds of resources by individual students gifted in science has been shown to have been considerably greater during the period of the tryout of the Gifted Science Project than during the year before. It therefore is reasonable to ascribe this increase in use to the project itself and to assume that such use would not have occurred without the project.

B. ASSESSMENT OF RESOURCES AND SERVICES (Evaluation Objectives 12 and 13)

1. Students

Students who had used a resource obtained through the PRF were asked to complete Student Feedback Report No. 4. The report listed 4 questions designed to elicit their satisfaction with the resource (see appendix C). Their answers to these questions are shown in table V. In all the categories except Project Ideas the majority of students responded positively. The majority of students who used resources in the Project Ideas category answered either No or Not Sure when asked whether they learned something new about how scientists work and whether they would like to use this science resource again. This can be explained to a certain extent by the nature of the category, since books in the category Project Ideas would seldom provide information on how scientists work and are not likely to be used repeatedly by the same student. A Likert-type scale was administered to determine the extent of the student's experience with a particular resource. The student answered three statements on a 5-point scale from A Lot to Almost None. As can be seen in table VI, students who had used resources in all except one of the categories answered questions positively (either A Lot or Some). The one exception was in the Science Processes category, where 60 percent of the students answered either Not Sure or No to the statement "This resource made me want to learn more about the science topic I studied."

The responses to these statements were also analyzed to determine whether there was any difference in attitude based on grade level. These results are shown in table VII. No real differences are apparent in these data. All grade levels answered each statement positively (A Lot or Some) more than 70 percent of the time with the exception of the eighth grade. Eighth grade students had a tendency to be either unsure or negative with regard to the statements "This resource made me want to learn more ..." (34 percent Very Little or Almost None). Though they do not represent the majority of eighth grade students who used resources in the PRF, these are the strongest instances of unsure or negative feedback seen when viewing data by grade level.

In addition to the forced-answer questions reported above, students were asked to respond to 5 open-ended questions (Questions 9 - 13 of Report No. 4; see appendix C). Questions 9 and 10 asked the student to elaborate on whether the resource had helped. Results are given by category in table VIII. Project Ideas is the only category for which there appears to be some ambivalence about whether the resource helped. In this category there were 31 statements of how resources helped and 13 of how they did not help. Typical examples of how resources helped include the following:

1. "Helped me understand how scientists work."

2. "Showed me how to make crystals."

3. "My skies have more glitter with starlight."

4. "Opened up a new science for me--I love particle physics."

Typical examples of statements of why resources did not help include the following:

1. "Knew most of the experiments already."

2. "Book confused me, too difficult."

3. "Didn't do anything."

Note that students may have answered both questions affirmatively, i.e., they may have felt they were helped in some ways and not in others.

Two questions asked the students to report what they liked about this science resource and what they did not like. The results are shown in table VIII. Students appeared to feel free to make comments. Many students answered both questions, saying what they had liked and what they had not. The categories in which the most comments were made were Mentors and Project Ideas. Though 33 percent of the responses in the category Mentors were critical as were 37 percent of those in the category Project Ideas, the majority of responses indicate that students were pleased with their experiences with the resources.

Students were also asked what other type of science help they would like to have. Answers to these questions were coded in the following manner (see table IX): whether they were interested in more help in the same science topic and, if so, whether they wanted books (including information) or a mentor; whether they wanted help in another science topic and, again, whether they wanted books or mentors; whether they wanted a place to visit; or whether they wanted no further help. In general, students who are interested in pursuing a resource in a science topic different from the one they have just used are more likely to want books or information than to want a chance to work with a mentor. In all categories except Activities, Mentors, and Science Processes, however, students expressed interest in studying more about the same science topic.

In general, all the results reported above indicate that students had positive experiences with the science resource they used. Considering the freedom with which they expressed themselves on the open-ended questions, it is not unreasonable to assume that their answers were candid. It seems likely, then, that students using resources from the PRF had experiences that were both desirable and (judging from the utilization study reported above) not feasible before the Gifted Science Project.

2. Teachers

All teachers of Grades 3-8 in the tryout schools were sent a Summary Comments Report No. 5 to complete (see appendix C). Of the 131 reports sent, 108 were returned. Of these, 37 teachers said they had used the PRF and 71 said they had not. The reasons cited for not using the PRF were as follows:

1. It was not applicable to the teaching assignment (28).
2. They were too busy to take the time (10).
3. They were not familiar with the PRF (9).
4. The PRF was too complicated (2).
5. There were no gifted children in the class (3).
6. The grade was not chosen as one of the participating ones (2).
7. The system did not work well (1).
8. The grade level did not cover what the student was interested in (1).
9. Other reasons (7).
10. No reason (10).

Teachers were asked to give their level of agreement on a Likert-type scale, with a series of 4 statements. The results of this scale are shown in table X. As can be seen, the majority of teachers agreed with the first 3 statements--that they were adequately informed of the purpose of the PRF, that the in-service manual helped them to use the PRF, and that the manual helped them complete the reports. There was marked ambivalence, however, with regard to the final statement, "The project helped me to meet the needs of my gifted science pupils." Though 40 percent of the teachers agreed that it had, 36 percent were not sure, and 24 percent did not feel that it had.

Teachers were also asked to list the things they liked about the project and their concerns about it. Some of the things they liked included the following:

1. Pupils were excited and seemed to learn things.
2. It was a valuable resource for students and teachers alike and took much of the research responsibility off the teacher.
3. It was stimulating to students and provided a challenge.

4. The fact that students were in a project got and kept them interested in science.

5. It offered an opportunity to see practical use of knowledge obtained from science units in the classroom.

6. Students became a resource for the teacher and other students.

7. Resource persons were very cooperative in helping students.

The greatest number of teachers who listed their concerns mentioned the problem of time needed to contact resources and arrange for their use by students and the time needed to complete evaluation forms. In addition, teachers mentioned the following concerns:

1. They hoped that the project would not become mandatory.

2. Students did not show the kind of independent follow-up necessary for successful implementation.

3. Gifted students had so many other afterschool activities that it was very hard to schedule more.

4. Very few of the recommended books were available.

5. Some mentors seemed to know less about the project than the teacher did.

6. Younger students (Grades 3, 4, and 5) did not fully appreciate the purpose of the program.

7. Success depended on parent cooperation.

8. Students were limited to working on objectives in their own grade level.

9. Some students found it hard to arrange for travel to and from community resources.

3. Media Specialists

Media specialists were asked to give their evaluation of the services and materials of the project in Media Specialist Report No. 6 (see appendix C). Information was received from 14 of the 15 county schools (the one Catholic school had no media specialist). The media specialists were asked whether they had requested materials from other project schools and/or had received such requests from other specialists. Only 3 schools reported receiving requests from other media specialists for materials identified in the PRF. One school had 3 requests, another

4, and the third 1. In answer to the second question, only 1 media specialist reported requesting materials from other schools, and she had made 4 such requests. A full accounting is not possible, but certain requests had to be made of more than 1 school, since the first school asked may not have had the book. When asked to identify resources that teachers and students found helpful but that were not listed in the PRF, no media specialist responded.

A final question asked whether the specialists felt that the organizational arrangement of the PRF was satisfactory. Ten of the respondents felt it was, 2 recommended an alternate system, and 2 did not feel familiar enough with the file to respond. Specific recommendations given by the media specialists will be discussed in a following section.

It appears that there was a fair amount of interaction between media centers of the project tryout schools and that the PRF in its present state was satisfactory to most of the schools' media specialists. A fuller discussion of the recommendations will be discussed in a later section.

4. Principals

Following completion of the project tryout principals were interviewed to find out their experiences with the project. A series of 5 open-ended questions was asked and responses were recorded by a GSP staff member.

In answering the first question, "Can you think of any problems with the project that relate to your role as a school administrator?" 10 principals either said that they could think of none or that there had been none. Problems mentioned included:

1. "Need more bodies to help teachers."

2. "Couldn't devote as much time to it as I would have liked."

3. "Teachers were frustrated that they had to serve as mediators between mentors and parents."

4. "No more than one project should be started in one school in any given year; mental energy is consumed by too many things and none get fair treatment."

5. "The participation of the principal should be structured into the project--for instance, a check-off list."

6. "Tactical problem with a pair of siblings when one did not want to be in the project."

The second question inquired, "Have you received any responses from your community about the project (either positive or negative)?" Five of the 16 principals reported that they had received no responses. Of the remaining 11, 2 had received neutral responses, 8 positive, and 1 negative. Positive responses were from parents on the school's committee for the gifted who were supportive and other parents who appreciated the individual attention provided their children. Negative comments included one from a parent who asked that the child be removed from the project because of already being involved in too many gifted programs. One parent wanted more information on the project in order to be more personally involved.

The third question asked, "Do you feel that this resource has helped you to meet the needs of your gifted students?" Answers ranged from 2 negatives to a range of qualified and enthusiastic affirmatives:

1. "Not particularly."
2. "Not that much--too time-consuming."
3. "Would help, but we've not effectively used the project."
4. "To a limited degree; only one student used it."
5. "Yes, for the two or three who got involved."
6. "Might have been more effective if the science staff were veterans to the school and knew the students."
7. "Has for students who used the program."
8. "For those interested in science, yes."
9. "Yes--has been reinforcement for specific program."
10. "Yes--especially because it was in a subject other than reading or math."
11. "Helped in two ways--schools are vulnerable to parent's criticism to meet student's needs, and this is an identified program to meet specific needs."
12. "Without question."
13. "Yes--anything like this would."
14. "Excellent program to have available; one more thing for bright kids."
15. "Absolutely, teachers unanimously feel that."

16. "Definitely has, we'd have been in big trouble with kids in the science program without this."

As can be seen from the range of these answers, schools had a variety of experiences with the project, ranging from minimal impact to substantial appreciation for filling an unmet need.

The fourth question asked, "Do you feel you were kept adequately informed on the project?" All principals answered Yes, although one principal would have liked to have a more structured role with regard to the project (e.g., a checklist to keep current on what was happening).

The fifth question asked of the principals, "Do you have any suggestions for improving the materials or services received from the project?", will be discussed in the section Recommendation for Program Revision.

The results of this informal survey were, with few exceptions, positive and showed an acceptance, on the part of most principals, of the project and its goals. It is apparent from the answers to the second question that the community (including the parents) has not been involved in the project thus far. To a certain extent, this has been due to the developmental status of the project: during the development period broad publicizing of the project was not desired, since project materials, procedures, and reports were continuously being revised.

C. ASSESSMENT OF STUDENT SCIENCE ATTITUDES (Evaluation Objective 12)

Teachers and resource persons were asked to note on Reports No. 3 and 8 whether they had observed a change in the student's behavior as a result of the use of that resource (see table XI). Teachers and resource persons were fairly evenly divided between feeling that there was a change in the student's attitude, feeling that there was no change, and being unsure. Resource persons (Activities and Mentors categories) tended to mark Not Sure more frequently. Some of them stated that they did not feel they knew the student well enough to judge whether a change had taken place. It appears that students were less likely to show a change in attitude or behavior when they used a resource in the Project Ideas category. In addition, it is more likely for teachers and resource persons to be unsure whether students using resources in the Activities and Visits categories had experienced any change. This is probably due to (1) the structured nature of such resources, which may preclude a close relationship between a student and a resource person, and (2) the fact that resource persons felt that they did not know the student well enough.

Very few backup comments were made to substantiate the answers to this question. It appears that it was difficult for both resource persons and teachers to make a judgment about any change in attitude which was directly related to the use of the resource.

D. SUMMARY OF PROGRAM EFFECTIVENESS (Evaluation Objective 14)

The results of the utilization study, based on feedback from students, teachers, media specialists, and principals, indicate that the PRF has provided possibilities for students that were not available before the Gifted Science Project began. For the most part these opportunities have been positively received, although the problems experienced by students, teachers, schools, and GSP staff indicate that there is room for improvement. In the next sections recommendations for revisions of the project and the PRF will be discussed.

III. RECOMMENDATIONS FOR PROGRAM REVISIONS

A. TEACHERS

Teachers were asked on the Summary Comments Report No. 5 to list any suggestions they had for improving the project. Suggestions included the following:

1. "Would help to have mentors' home phone numbers so that teachers could reach them after working hours."
2. "Direct parent-mentor contact would eliminate the need for a middleman."
3. "Would expedite process if a sheet could be devised informing the parent of the project topic and the time availability of the contact."
4. "Students need a follow-up after each meeting with a contact."
5. "Would be easier to use if there were a coordinator to help bring together students of similar interests in the same school or nearby area schools. Coordinator would be a parent volunteer trained in the program who could work with the teacher."
6. "Should have some sort of system students could use."
7. "Students could better decide if they were allowed to use the files (phone numbers could be omitted)."
8. "Would be nice to have an aide to help with the program."
9. "Another in-service training session should be provided."
10. "Find mentors and resources convenient to all parts of the county."

11. "Raise the level of print materials; they seem to be appropriate for only elementary students."

12. "Would like a half-day per semester to do PRF research."

13. "PRF should be enlarged so that students could study any area they were interested in."

B. PRINCIPALS

The fifth question asked during the informal principal survey was whether principals had any suggestions for improving the materials or services received from the project. Five said that the delivery of services from project staff had been excellent. Other specific suggestions are listed below:

1. "Only schools that really want to participate should be chosen."

2. "Find someone who can follow through with paperwork so that the teacher doesn't have to do it all."

3. "Program should be presented at PTA and faculty meetings in order to show the school how others have used the project and resources."

4. "Resources should be kept current."

5. "Project should be publicized more."

6. "Would like to have materials travel to each school so that staff can see them before they decide which to purchase."

7. "Would be nice if resource could travel to the school."

8. "Teachers need more in-service sooner."

9. "'Discovery' type of materials would be nice."

10. "Create a 'club' for students and parents so that interest in the project would be more on the local level."

IV. RECOMMENDATIONS FOR REVISIONS OF THE PROJECT RESOURCE RETRIEVAL SYSTEM

A. TEACHERS

Of the teachers who answered Question 6 on the Summary Comments Report No. 5, 59 felt that the arrangement of the PRF was satisfactory, 4 did not, and 1 was unsure. Two of the teachers had suggestions for alternate organizations. One wanted the PRF arranged so that students could use resources in topics that might be listed for grade levels other than their own. The other suggestion was to have resources listed by topic, with objective(s) and grade level(s) noted for each resource. Each teacher could then have a looseleaf notebook of these 6 lists (1 for each topic) and an index describing each resource in detail. This would eliminate the need to describe each resource by grade, topic, and category.

B. MEDIA SPECIALISTS

Three of the 14 media specialists who completed Report No. 6 made specific recommendations for revising the Project Resource File. Two felt that the file needed to be more encompassing, because students were interested in subjects that were not necessarily part of the curriculum at their grade level. In addition, 1 specialist felt that science books already a part of the school's collection should be considered for the file, since it was frustrating not to be able to find a book that sounded excellent. It was also suggested that the PRF be reorganized primarily by topic, with the grade level as the last discriminating factor. The third media specialist's recommendation dealt specifically with the organization of the PRF. It was suggested that the file be separated into two sections, one for print materials and the other for resource persons. Placing all print materials in a separate section would make it possible for students to have access to them without compromising the telephone numbers of mentors. In addition, it would make updating the file easier, since only the fiche on which mentors were listed would need to be changed. Only 1 of the 14 completing the report listed desired resources that were not in that school's collection. This respondent identified 12 resources in the categories Project Ideas, Science Processes, and Career Information.

V. DEVELOPMENT OF INSTRUCTIONAL AND ENRICHMENT OBJECTIVES (Evaluation Objective 16)

In an attempt to determine instructional and enrichment objectives for gifted science students, teachers and resource persons were asked to note, on a scale of 9 items ranging from low- to high-level thinking, which levels students had employed when they used that resource. The results of these student experiences are shown in table XII. A wide range of experiences (from low- to high-level) was evidenced in the categories Activities, Mentors, and Project Ideas. It appears that working with a resource person (in the categories Activities and Mentors) does tap higher level thinking. It is also encouraging to note that students who used resources in the category Project Ideas did much more than just read them; in many cases they carried out projects or experiments.

Although the answers to this scale provide us with some indication of the kinds of experiences these students had with their resources, they do not provide enough information to develop objectives for gifted science students. It may be, however, that if this scale were provided to resource persons before they worked with students, they might choose to direct students into higher level activities.

VI. COST ANALYSIS
(Evaluation Objective 18)

Cost analyses have been compiled for the following items:

1. Operating the 3-year Gifted Science Project
2. Developing the project for tryout in 16 schools
3. Conducting the project tryout for 16 schools
4. Countywide implementation for 149 schools in science, Grades 3-8
5. Expanding the GSP to other grade levels (K-2, 9-12)
6. A similar project in another subject area
7. Microfiche PRF as compared with paper PRF
8. Microfiche format used during the tryout as compared with revised format resulting from the tryout.

The costs for Items 1, 2, and 3 are for the most part actual budget figures. All remaining costs are estimates based on the costs in effect at the time of this writing.

ITEM 1

Cost of Operating the 3-Year Gifted Science Project
(Based on Budget for 7-1-77 to 6-30-80)

Funded by Title IV-C Grant		
Teacher Specialists (3)	$174,879	
Clerical, Part-time	14,135	
Professional, Part-time	17,512	
Substitute Teachers	1,739	
Consultant	4,139	
Instructional Supplies	6,680	
Office Supplies	4,300	
Local Travel	2,538	
Other Travel	562	
Furniture and Equipment	1,258	
Fringe Benefits	34,223	
SUBTOTAL		$261,965
Funded in Kind by MCPS (Estimates)		
Director, Part-time	26,250	
Phone	600	
Mailing	300	
Printing	800	
Fringe Benefits	5,250	
SUBTOTAL		$33,200
TOTAL COST OF OPERATING THE PROJECT FOR THREE YEARS		$295,165

ITEM 2

Cost of Developing the Project for Tryout in 16 Schools
(Based on Budget Payments from 7-1-77 to 10-1-79)

Funded by Title IV-C Grant		
Teacher Specialists (3)	$110,366	
Clerical, Part-time	8,672	
Professional, Part-time	8,459	
Substitute Teachers	8,176	
Consultant	1,621	
Instructional Supplies	3,368	
Office Supplies	3,133	
Local Travel	1,207	
Other Travel	562	
Furniture and Equipment	1,257	
Fringe Benefits	25,924	
SUBTOTAL		$172,745
Funded in Kind by MCPS (Estimates)		
Director, Part-time	19,700	
Phone	500	
Mailing	200	
Printing	750	
Fringe Benefits	3,940	
SUBTOTAL		$25,090
TOTAL COST OF DEVELOPING THE PROJECT		$197,835

ITEM 3

Cost of Conducting the Project Tryout for 16 Schools
(Based on Budget Payments from 10-1-79 to 2-1-80)

Funded by Title IV-C Grant		
Teacher Specialists (3)	$22,411	
Clerical, Part-time	2,338	
Instructional Supplies	191	
Office Supplies	683	
Local Travel	117	
Fringe Benefits	5,029	
SUBTOTAL		$30,769
Funded in Kind by MCPS (Estimates)		
Director, Part-time	2,900	
Phone	50	
Mailing	25	
Fringe Benefits	580	
SUBTOTAL		$3,555
TOTAL COST OF CONDUCTING THE PROJECT TRYOUT		$34,324

ITEM 4

Cost of Countywide Implementation for 149 Schools in Science, Grades 3-8
(Estimate)

Director, Part-time	$8,750	
Teacher Specialist (Full-time to Provide In-service)	27,600	
Clerical, Part-time	3,600	
Microfiche for 149 Schools, 5 Area Offices, and 1 Central Office	154	
User's Manual (5 Copies per School)	370	
Substitute Teachers (½ Day In-service)	2,869	
Local Travel	500	
Phone	100	
Fringe Benefits	7,990	
TOTAL COST OF COUNTYWIDE IMPLEMENTATION		$51,933

ITEM 5

Cost of Expanding Project in Science to Other Grade Levels, K-2 and 9-12
(Estimate)

Director, Part-time	$8,750
Teacher Specialist, Full-time for 1 year	27,600
Clerical, Part-time	3,600
Microfiche for 169 Schools, 5 Area Offices, and 1 Central Office	226
User's Manual (5 Copies per School)	530
Substitute Teachers (½ Day In-service)	3,211
Local Travel	200
Phone	150
Fringe Benefits	7,990
TOTAL COST OF EXPANDING PROJECT TO OTHER GRADE LEVELS	$52,257

ITEM 6

Cost of a Similar Project in Another Subject Area, Grades K-12 (Estimate)

Director, Part-time	$8,750
Teacher Specialist, Full-time for 1 year	27,600
Clerical, Part-time	3,600
Microfiche for 169 Schools, 5 Area Offices, and 1 Central Office	226
User's Manual (5 Copies per School)	530
Substitute Teachers (½ Day In-service)	3,211
Local Travel	300
Phone	200
Mailing	100
Printing	200
Fringe Benefits	7,990
TOTAL COST OF EXPANDING TO ANOTHER SUBJECT AREA	$52,707

ITEM 7

Cost of Microfiche PRF Compared with Paper

Paper Copy for 15 Tryout Schools, 5 Area Offices, and 1 Central Office	$662
Microfiche for Same	441
SAVINGS OBTAINED BY USING MICROFICHE INSTEAD OF PAPER COPY	$221

ITEM 8

Cost of Microfiche Format Used During Tryout Compared with Revised Format Resulting From the Tryout

Cost of Tryout Format for 149 Schools	$985	
Cost of Revised Format for 149 Schools	154	
SAVINGS OBTAINED WITH REVISED FORMAT		$831

VII. SUMMARY

The analyses in this report have addressed the evaluation objectives listed in the GSP proposal. The use of resources has been identified; resources and services have been assessed; and changes in student science attitudes, as well as recommendations for revisions to the project and its materials and service, have been noted. All this information, though primarily collected to satisfy the project's evaluation objectives, has provided project staff with the information needed to revise and improve the project materials for implementation. New emphases will be placed on in-service training in 1980-81. In addition, the PRF organizational system has been completely revised according to the suggestions noted in this report.

TABLE I

Total Number of Resources Used
Before and During Gifted Science Project Tryout

October 1, 1979 - January 31, 1980

Category	Total Resources Used Prior to Project (As Reported by Student)*	Total No. of Resources Used During Project Tryout	% Increase in Use
Activities	0	16	1,600
Awards and Competitions	0	0	0
Career Information	0	7	700
Courses, Lectures, and Seminars	0	2	200
Libraries	0	0	0
Mentors	1 (adjusted 0.33)	56	16,870
Project Ideas	6 (adjusted 2)	43	2,050
Science Processes	0	6	600
Visits	0	5	500

* (Adjusted to Reflect 4-Month Period)

TABLE II

Use of Different Resources During the Gifted Science Project Tryout
October 1, 1979 - January 31, 1980

Category	No. of Different Resources Used During Tryout	Total No. of Resources in PRF	% Used During Tryout
Activities	6	50	12
Awards and Competitions	0	1	0
Career Information	6	61	10
Courses, Lectures, and Seminars	1	8	12.5
Libraries	0	6	0
Mentors	33	89	37
Project Ideas	29	140	21
Science Processes	4	42	9.5
Visits	2	9	22

TABLE III

Resource Persons Used
Before and During the Gifted Science Project Tryout
October 1, 1979 - January 31, 1980

No. of Different Resource Persons Used Prior to Project*	No. of Different Resource Persons in PRF Used During Project Tryout	No. of Different Resource Persons Sampled	% Used Prior to Project	% Used During Tryout	% Increase
5 (adjusted 1.67)	31	78	1.6	39.7	1,756

* (As Reported by Resource Person and Adjusted to Reflect 4-Month Period)

TABLE IV

Supplementary Information Obtained from
Resource Persons During Gifted Science Project Tryout
October 1, 1979 - January 31, 1980

Category	Method of Communication										Average Time Spent with Student (Hrs.)
	Visited at Work		Visited at Home		By Telephone		By Writing		Another Way		
	No.	%	No.	%	No.	%	No.	%	No.	%	
Activities	12	71	0	0	4	24	0	0	1	5	2.2
Mentors	39	61	1	2	17	27	1	2	6	9	3.8
Visits	3	100	0	0	0	0	0	0	0	0	2.5

TABLE V

Student Assessment of Resources
Used During Gifted Science Project Tryout
October 1, 1979 - January 31, 1980

Category	Did you learn something new about how scientists work?			Did this science resource help you?			Would you like to use this science resource again?			Would you like to learn more about this topic using a different science resource?		
	Question and Student Response (%)											
	Yes	No	Not Sure	Yes	No	Not Sure	Yes	No	Not Sure	Yes	No	Not Sure
Activities	75	19	6	75	0	25	75	0	25	50	19	31
Awards and Competitions	0	0	0	0	0	0	0	0	0	0	0	0
Career Information	100	0	0	71	0	29	57	14	29	86	0	14
Courses, Lectures, and Seminars	50	50	0	100	0	0	100	0	0	50	0	50
Libraries	0	0	0	0	0	0	0	0	0	0	0	0
Mentors	74	11	15	77	8	15	65	7	27	57	10	33
Project Ideas	43	30	27	66	14	20	48	23	30	73	5	23
Science Processes	60	40	0	60	0	40	80	20	0	60	0	40
Visits	50	25	25	50	0	50	50	0	50	75	25	0

TABLE VI

Student Attitude Toward Resources
Used During Gifted Science Project Tryout
(By Category)

October 1, 1979 - January 31, 1980

Category	Student Attitude (%)														
	I learned new things.					This science resource made me want to learn more about the science topic I studied.					I liked this science resource.				
	A Lot	Some	Not Sure	Very Little	Almost None	A Lot	Some	Not Sure	Very Little	Almost None	A Lot	Some	Not Sure	Very Little	Almost None
Activities	64	29	0	7	0	36	36	21	7	0	93	7	0	0	0
Career Information	71	14	0	14	0	86	14	0	0	0	71	29	0	0	0
Courses, Lectures, and Seminars	0	100	0	0	0	50	0	50	0	0	50	50	0	0	0
Mentors	37	57	0	4	2	47	33	14	4	2	67	24	4	4	2
Project Ideas	20	68	7	5	0	48	20	18	11	2	52	27	7	11	2
Science Processes	60	20	0	2	0	20	20	40	20	0	100	0	0	0	0
Visits	25	75	0	0	0	75	25	0	0	0	75	25	0	0	0

TABLE VII

Student Attitude Toward Resources
Used During Gifted Science Project Tryout
(By Grade)
October 1, 1979 - January 31, 1980

Grade	I learned new things.					This science resource made me want to learn more about the science topic I studied.					I liked this science resource.				
	A Lot	Some	Not Sure	Very Little	Almost None	A Lot	Some	Not Sure	Very Little	Almost None	A Lot	Some	Not Sure	Very Little	Almost None
3	50	50	0	0	0	83	8	8	0	0	92	8	0	0	0
4	27	61	3	6	3	54	24	9	9	3	78	18	0	0	3
5	47	44	4	7	0	42	31	18	7	4	60	31	7	4	0
6	56	33	0	11	0	56	22	11	11	0	78	11	0	11	0
7	30	70	0	0	0	30	50	20	0	0	70	20	10	0	0
8	11	78	6	6	0	33	22	33	11	0	33	33	0	28	6

TABLE VIII

Student Report of Satisfaction with Resource
Used During Gifted Science Project Tryout

October 1, 1979 - January 31, 1980

Category	If the science resource helped you, tell us how it helped you. (%)	If the science resource did not help you, tell us why it did not. (%)	Total No. of Responses (%)	What did you like about this science resource? (%)	What did you NOT like about this science resource? (%)	Total No. of Responses
Activities	100	0	16	84	16	19
Career Information	86	14	7	88	12	8
Courses, Lectures, and Seminars	100	0	2	67	33	3
Mentors	92	8	50	67	33	72
Project Ideas	40	30	44	63	37	60
Science Processes	80	20	5	80	20	5
Visits	100	0	4	67	33	6

TABLE IX

Student Requests for Other Science Help
from Gifted Science Project

October 1, 1979 - January 31 1980

	Same Science Topic		Another Science Topic				
Category	Book (Information) (%)	Mentor (%)	Book (Information) (%)	Mentor (%)	Visit (%)	No More Help (%)	No. of Responses
Activities	33	13	47	0	0	7	15
Career Information	29	43	29	0	0	0	7
Courses, Lectures, and Seminars	0	100	0	0	0	0	1
Mentors	35	14	31	2	10	8	49
Project Ideas	35	17	28	0	17	2	46
Science Processes	33	0	33	0	33	0	3
Visits	33	33	33	0	0	0	3

TABLE X

Teacher Assessment of Gifted Science Project

October 1, 1979 - January 31, 1980

Statement to Which Teacher was to Respond	Level of Agreement									
	Strongly Agree		Agree		Not Certain		Disagree		Strongly Disagree	
	No.	%	No.	%	No.	%	No.	%	No.	%
I was adequately informed of the purpose of the Project Resource File before using it.	22	28	37	47	11	14	6	8	2	3
The In-Service Manual helped me use the Project Resource File.	11	19	31	53	9	15	7	12	0	0
The In-Service Manual helped me complete the necessary reports.	9	18	21	43	11	22	7	14	1	2
The project helped me meet the needs of my gifted science pupils.	8	15	14	25	20	36	11	20	2	4

TABLE XI

Student Attitude Change
As Reported by Teachers and Resource Persons *
During the Gifted Science Project Tryout
October 1, 1979 - January 31, 1980

Category	Yes (%)	No (%)	Not Sure (%)	No. of Responses
Activities	18	0	82	11
Career Information	60	40	0	5
Courses, Lectures, and Seminars	100	0	0	2
Mentors	39	20	41	41
Project Ideas	36	52	12	33
Science Processes	20	40	40	5
Visits	25	25	50	4
Total	36 %	30 %	34 %	101

* The question to which teachers responded was "Have you observed a change in science attitude, interest, motivation, or other behaviors, stated or demonstrated by the student, which you feel was directly related to his/her involvement with the resource (you)?"

TABLE XII

Student Experiences as Reported by Teachers and Resource Persons
During the Gifted Science Project

October 1, 1979 - January 31, 1980

Student Experiences	Category													
	Activities		Career Information		Courses, Lectures, and Seminars		Mentors		Project Ideas		Science Processes		Visits	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1. The student received information through conversation, reading, or observation or was provided data.	13	27	6	50	2	33	47	35	39	32	5	42	4	36
2. The student observed objects and/or phenomena.	11	23	2	7	2	33	28	21	19	14	2	17	4	36
3. The student measured objects and/or phenomena.	3	6	0	0	0	0	11	8	7	6	1	8	0	0
4. The student formulated a hypothesis.	1	2	1	8	1	17	9	7	12	10	1	8	0	0
5. The student designed procedures for testing a hypothesis.	2	4	0	0	0	0	4	3	5	4	0	0	0	0

TABLE XII

Student Experiences Reported by Teachers and Resource Persons During the Gifted Science Project (Continued)

October 1, 1979 - January 31, 1980

Student Experiences	Category															
	Activities		Career Information		Courses, Lectures, and Seminars		Mentors		Project Ideas		Science Processes		Visits	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
6. The student carried out an activity to solve a problem or test a hypothesis	11	23	0	0	0	0	12	9	13	11	1	8	0	0
7. The student used knowledge and/or skills to describe and/or construct a theoretical model.	0	0	0	0	1	17	4	3	3	2	0	0	0	0
8. The student applied newly acquired scientific knowledge to other problems.	3	6	2	17	0	0	5	4	11	9	1	8	3	28
9. The student developed and/or used manual skills.	4	8	1	8	0	0	15	11	12	10	1	8	0	0

APPENDIX A
RESOURCE CATEGORIES AND EXAMPLES IN THE PRF

********** COMMUNITY RESOURCES **********

1. Activities - demonstrations, investigations, or experiments that are identified and supervised by resource persons and that support selected topics and objectives.
   Example: The student will help a forester conduct an inventory of woodland plants and environmental conditions in a forest environment.

2. Awards and Competitions - recognition earned by developing and presenting a science project or paper.
   Example: The student will participate in the Montgomery Area Science Fair.

3. Courses, Lectures, and Seminars - science programs sponsored by educational institutions or organizations.
   Example: The student will attend a health seminar sponsored by the National Institutes of Health.

4. Libraries - specialized collections of science-related media.
   Example: The student will use the Medowside Nature Center Library under the direction of a naturalist.

5. Mentors - resource persons who discuss by telephone or in person science topics and objectives and might suggest reading material, ideas for further work, and other resources.
   Example: The student will meet with a scientist from NASA and discuss the student's interests.

6. Visits - behind-the-scenes tours not normally available to the public or public tours related to science topics and objectives.
   Example: The student will tour the University of Maryland cyclotron.

********* PUBLISHED MATERIALS *********

1. Career Information - published materials that describe science or science-related jobs and careers.
   Example: The student will use the book Veterinary Medicine and Animal Care Careers to learn about science careers.

2. Project Ideas - published materials that describe science investigations for use by students on an individual basis or with a resource person.
   Example: The student will use the book Adventures in Electrochemistry to develop a science project.

3. Science Processes - published materials that describe science procedures and skills, such as laboratory techniques; suggestions for science problem solving; and the collection, processing, analysis, and presentation of data.
   Example: The student will use the book How to Make Your Science Project Scientific to develop science process skills.

APPENDIX B
PROJECT OBJECTIVES

Gifted Science Project
A Supplementary Education Service
for
Gifted Students and Their Teachers-Science
ESEA, Title IV, Part C

Developmental

1. The resource categories related to education for the gifted available to MCPS will be identified.

2. The bank of basic and supplementary instructional objectives for the science curriculum will be completed for Grades 3-8.

3. The resources available in each category will be identified and cross-referenced to the bank of basic objectives for the science curriculum.

4. The identified resources will be placed into a microfiche retrieval system.

5. A staff in-service training program will be developed and administered.

6. The system for retrieving the resources will be installed in the central media center and 16 local school media centers.

7. The tryout of the project will be completed.

8. The design for a systemwide organization, administration, and dissemination of services will be completed.

9. Sample project materials will be prepared for dissemination to interested persons and the project will be publicized statewide and nationally.

Evaluative

10. The history of utilization of identified resources prior to the onset of the project will be compiled to establish the data base.

11. The utilization study for the 1979 calendar year will be completed.

12. The quality of each resource or activity will be evaluated by the users.

13. Student, teacher and mentor satisfaction with the administration and services provided by the project will be evaluated.

14. The assessment of program effectiveness during the first project year will be completed.

15. Required revisions to the project activities will be identified.

16. The bank of basic instructional objectives and enrichment objectives for gifted and talented students will be revised as indicated from the project evaluation efforts.

17. The resource retrieval system will be modified as indicated from the project evaluation efforts.

18. A cost-effectiveness study of utilization will be completed.

APPENDIX C
REPORT NO. 1
TEACHER NOTES

Completed by: Teacher
Purpose: Record information on resource selected
Distribution: Gifted Science Project office and STUDENT ENVELOPE

Directions: See the printed information on the back of the yellow copy.

A. Student_____ Grade_____
(Last) (First) (Middle)

Teacher_____ School_____
(Last) (First) (Middle)

B. Resource File No.:_____ Fiche:_____ Page:_____

CONTACT or TITLE:_____

ADDRESS or AUTHOR:_____

TELEPHONE:_____ HOURS:_____

C. Notes

D. Mark the box of the statement which applies:

☐ The resource will be used by the student. (Complete sections E and F and distribute copies as directed below.)

☐ No attempt was made to use the resource. (File both copies of this report in the STUDENT ENVELOPE and DO NOT send the white copy to the Gifted Science Project office.)

☐ An attempt was made to use the resource. However, it could not be arranged. (Please explain below, then file both copies of this report in the STUDENT ENVELOPE and DO NOT send the white copy to the Gifted Science Project office.)

E. Expected starting date:_____ Estimated completion date:_____

F. Who will work directly with the student?

☐ Teacher
☐ Media specialist
☐ CONTACT shown above
☐ Person other than CONTACT shown above.
Give name_____
☐ Do not know

DISTRIBUTION: White/Gifted Science Project office; Yellow/STUDENT ENVELOPE

GSP REPORT NO. 1
1/79

APPENDIX C (CONTINUED)
REPORT NO. 1
TEACHER NOTES

Purpose: This report will be used by a teacher to record information on the use of a resource selected from the Project Resource File. It will include details on how the student will use the resource. The project staff will use this information to administer project evaluation reports.

Directions: Use a *separate* TEACHER NOTES for each resource selected.

A. PRINT the requested information.

B. Copy the resource information *exactly* as it appears in the Project Resource File.

C. Use this section to record:
- Notes on telephone conversations with the child's parent(s) and the CONTACT.
- The name of the person who will work directly with the student if different from the CONTACT.
- Errors discovered in the resource description in the Project Resource File.
- Information the project staff should know concerning the resource (e.g., appropriateness, special problems, concerns).

D. When it is decided whether the resource will be used, mark the box which applies.

E. If the student will use the resource, write the expected starting and the estimated completion dates in these spaces.

F. Mark the box which shows who will work directly with the student. *This information is essential for the administration of later evaluation reports.*

If the first box in section D was marked, distribute the copies of this report as shown. Otherwise, file both copies in the STUDENT ENVELOPE.

APPENDIX C (CONTINUED)
REPORT NO. 2
PRIOR EXPERIENCES

Completed by: Teacher
Purpose: Identify student's prior science experiences
Distribution: Gifted Science Project office and STUDENT ENVELOPE

Directions: See the printed information on the back of the yellow copy.

Student_____ Grade_____ Report Date_____

Teacher_____ School_____

Number of Experiences	Resource Category	Description
____	1. Activity:	
____	2. Award or Competition:	
____	3. Career Information:	
____	4. Course, Lecture, or Seminar:	
____	5. Library:	
____	6. Mentor:	
____	7. Project Ideas:	
____	8. Science Processes:	
____	9. Visit:	

Other Science Activities

☐ (a) The student did not participate in any of the science activities listed above.

OR

☐ (b) The student participated in a science activity other than those described above. Description:

DISTRIBUTION: White/Gifted Science Project; Yellow/STUDENT ENVELOPE

GSP REPORT NO. 2
1/79

APPENDIX C (CONTINUED)
REPORT NO. 2
PRIOR EXPERIENCES

Purpose: This report will be used by a teacher to provide information on the nature of the student's science experiences during the 1978 calendar year.

Directions:

1. Read the resource category descriptions below.
2. Interview the student and identify the types of resources he/she experienced during the period January 1, 1978 to December 31, 1978, which is prior to the project tryouts. Write the number of different experiences the student had for each resource category which applies. Briefly describe the experiences.
3. Use a return addressed envelope, found in the STUDENT ENVELOPE, to send the white copy to the Gifted Science Project office. File the yellow copy in the STUDENT ENVELOPE.

Resource Category Descriptions

1. Activity. On an individual basis, the student met with a science resource person and completed a science activity.

2. Award or Competition. The student participated in an activity or competition for an award or other recognition by developing and presenting a science project or paper.

3. Career Information. On an individual basis, the student conversed with a resource person or read published material which described science or science-related jobs and/or careers.

4. Course, Lecture, or Seminar. The student attended a specialized science course, lecture, or seminar.

5. Library. On an individual basis, the student used a specialized library to locate science information.

6. Mentor. On an individual basis, the student met with a scientist or other science resource person to discuss a science topic. The resource person might have suggested additional readings, resources, and/or ideas for further work.

7. Project Ideas. On an individual basis, the student used published material to do an individualized science project. The published material was used for independent study or in conjunction with a resource person.

8. Science Processes. On an individual basis, the student used published material to develop skills and processes of science. These could have included laboratory skills; suggestions for science problem solving; and discussions concerning the collection, processing, analysis, and presentation of data.

9. Visit. On an individual basis, the student toured a science or science-related facility. This could have included a personalized tour led by a resource person to observe activities and/or procedures not normally available to the public.

DISTRIBUTION: White/Gifted Science Project; Yellow/STUDENT ENVELOPE

APPENDIX C (CONTINUED)
REPORT NO. 3
TEACHER FEEDBACK

Completed by: Teacher
Purpose: Describe the student's experience with a resource
Distribution: Gifted Science Project office

Student_____ Resource File No._____

Teacher_____ School_____

Resource_____

Directions: Our records indicate that the student named above used a Gifted Science Project (GSP) resource. Please interview the student and record the information below. If you need help, call the GSP office at 279-3500 between 8:30 a.m. and 5:00 p.m. The best time to call is between 8:30 a.m. and 12:30 p.m. when part-time clerical staff are present. Return this report within two days by using the enclosed, addressed, return envelope.

I. Student Experiences. Nine types of student experiences are listed below. Interview the student and mark the boxes for *all* statements which *best* describe his/her experiences while he/she used the resource. Briefly describe the experiences you marked.

☐ 1. The student received information through conversation, reading, or observation or was provided data.
Description:

☐ 2. The student observed objects and/or phenomena.
Description:

☐ 3. The student measured objects and/or phenomena.
Description:

☐ 4. The student formulated a hypothesis related to a problem.
Description:

☐ 5. The student designed procedures for testing a hypothesis.
Description:

☐ 6. The student carried out an activity to solve a problem or test a hypothesis.
Description:

☐ 7. The student utilized knowledge and/or skills to describe and/or construct a theoretical model.
Description:

☐ 8. The student applied newly acquired scientific knowledge to other problems.
Description:

☐ 9. The student developed and/or used manual skills.
Description:

APPENDIX C (CONTINUED)
REPORT NO. 3
TEACHER FEEDBACK

II. Supplementary Information. Please respond to the items below.

☐ YES
☐ NO
☐ UNCERTAIN

1. (a) Have you observed a change in science attitude, interest, motivation, or other behaviors, stated or demonstrated by the student, which you feel was directly related to his/her involvement with the resource?

(b) Describe your observations of this change and add comments you feel would help to describe the change.

2. State any difficulty the student encountered in using the resource.

3. Use this space for additional comments you wish to make.

APPENDIX C (CONTINUED)
REPORT NO. 4
STUDENT FEEDBACK

Completed by: Student
Purpose: Describe the student's experience with the resource
Distribution: Gifted Science Project office

Student _____ Resource File No. _____

Teacher _____ School _____

Resource _____

TO THE STUDENT: We want to know what you did with the science resource you used and how you liked it. Please help us by answering these questions. Read the directions carefully since each part asks you to do different things. *If you need help or do not understand what you are to do, ask your teacher for help.* When you have finished answering the questions, give this report to your teacher.

Part I Directions: The questions in this part refer to the science resource you used. Answer each question by putting an X in one of the boxes. If you can't decide on a YES or NO answer, then put an X in the box NOT SURE.

	YES	NOT SURE	NO
1. Did you learn something new about how scientists work?			
2. Did this science resource help you?			
3. Would you like to use this science resource again?			
4. Would you like to learn more about this topic using a different science resource?			
5. a. Did you use a resource like this last year?			

	ON MY OWN	WITH OTHERS
b. If your answer is YES, mark whether it was on your own or with other students.		

Part II Directions: The sentences in this part refer to your use of the science resource. Put an X in the space which best describes your experiences.

	A LOT	SOME	NOT SURE	VERY LITTLE	ALMOST NONE
6. I learned new things.					
7. This resource made me want to learn more about the science topic I studied.					
8. I liked this science resource.					

THERE ARE MORE QUESTIONS ON THE OTHER SIDE

GSP REPORT NO. 4
Revised 8/79

Page 1 of 2

APPENDIX C (CONTINUED)
REPORT NO. 4
STUDENT FEEDBACK

Part III Directions: Write your answer to each question in the space below it.

8. What kinds of things did you do when you used this science resource?

9. If the science resource helped you, tell us how it helped you.

10. If the science resource did NOT help you, tell us why it did not.

11. What did you like about this science resource?

12. What did you NOT like about this science resource?

13. What other type of science help would you like to have?

AS SOON AS YOU HAVE FINISHED, GIVE THIS REPORT TO YOUR TEACHER

APPENDIX C (CONTINUED)
REPORT NO. 5
SUMMARY COMMENTS

Completed by: Teacher
Purpose: Describe the teacher's experience with the Project
Distribution: Gifted Science Project office

Teacher _____ School _____

Directions: This report contains three parts. Please return the completed report within two days by using the enclosed envelope.

Part I Directions: Please mark the box of your choice for number 1 and, if appropriate, elaborate below.

1. Did you use the Gifted Science Project Resource File? ☐ Yes ☐ No

   If you did not use the Project Resource File, please tell us why.

   ☐ It was not applicable to my teaching assignment

   ☐ Other (please explain) _____

Part II Directions: Put an X in the box under the column which best describes your level of agreement with each statement. You can elaborate on your answers in Part III of this report.

	Strongly Agree	Agree	Not Certain	Disagree	Strongly Disagree
2. I was adequately informed of the purpose of the Project Resource File before using it.					
3. The IN-SERVICE MANUAL helped me use the Project Resource File.					
4. The IN-SERVICE MANUAL helped me complete the necessary project reports.					
5. The project helped me meet the needs of my gifted science pupils.					

Part III Directions: Please mark the box of your choice for number 6 and write a brief statement for items 7 and 8.

6. Resources in the Project Resource File can be located by grade level, followed by topics for each grade level, followed by resource categories for each topic. Items are alphabetized within each topic and category. They are not alphabetized by objective; however, the objective number is on each item in the Project Resource File.

   Mark the box of your choice.

   ☐ This arrangement is satisfactory and should not be changed.

   ☐ An alternative system should be used. (Please explain on the reverse side.)

7. List the things you like about the project.

8. Please use the reverse side to list your concerns or suggestions.

APPENDIX C (CONTINUED)
REPORT NO. 6
MEDIA SPECIALIST FEEDBACK

Completed by: Media Specialist
Purpose: Describe use of and recommendations for improving the project products and services
Distribution: Gifted Science Project office

Media Specialist_____ School_____

This report will provide an anecdotal record of the use of the Project Resource File in your school.

I. STUDENT ENVELOPE Log

Directions: Each time a teacher is issued a STUDENT ENVELOPE, record the information below. Use the Comment section for any notes that you wish to make. When a STUDENT ENVELOPE is returned duirng the project tryout or at the end of the tryout, record the date in the space provided. Use additional copies of this page as necessary.

Teacher	Student	Date ENVELOPE issued	Date ENVELOPE returned	Comment

APPENDIX C (CONTINUED)
REPORT NO. 6
MEDIA SPECIALIST FEEDBACK

II. Revision and Deletion Recommendations

Directions: If you feel that an item in the Project Resource File which describes published material should be revised or deleted, record the information in the chart below. Use additional copies of this page as necessary.

Resource File No.	CHECK ONE		Reason for Recommendation
	Revise	Delete	

APPENDIX C (CONTINUED)
REPORT NO. 6
MEDIA SPECIALIST FEEDBACK

III. Desirable Additions to the School Collection

Directions: Published materials in the Project Resource File might not be part of your school's collection. If you received a request for an item you feel would be a desirable addition to your collection, list its Resource File No. in one of the spaces below.

1.	21.	41.	61.	81.
2.	22.	42.	62.	82.
3.	23.	43.	63.	83.
4.	24.	44.	64.	84.
5.	25.	45.	65.	85.
6.	26.	46.	66.	86.
7.	27.	47.	67.	87.
8.	28.	48.	68.	88.
9.	29.	49.	69.	89.
10.	30.	50.	70.	90.
11.	31.	51.	71.	91.
12.	32.	52.	72.	92.
13.	33.	53.	73.	93.
14.	34.	54.	74.	94.
15.	35.	55.	75.	95.
16.	36.	56.	76.	96.
17.	37.	57.	77.	97.
18.	38.	58.	78.	98.
19.	39.	59.	79.	99.
20.	40.	60.	80.	100.

IV. Additional Information

Directions: Write your answers in the space provided.

1. Have you had requests from media specialists from other pilot schools to share published materials, identified in the Project Resource File?

☐ YES Estimate the number of requests_____
☐ NO

2. Have you requested other media specialists to share published materials from their collection which were identified in the Project Resource File?

☐ YES Estimate the number of requests_____
☐ NO

3. Use the space below to identify resources (published or other) which you, teachers, or gifted science students have found helpful and which are not now listed in the Project Resource File. (Add additional sheets as necessary).

4. Resources in the Project Resource File can be located by grade level, followed by topics for each grade level, followed by resource categories for each topic. The item are alphabetized within each topic and category. They are not alphabetized by objective, however, the objective number is on each item in the Project Resource File.

Mark the box of your choice.

☐ (a) This arrangement is satifactory and should not be changed.
☐ (b) I recommend an alternative system be used. Please explain below.

5. List your concerns or suggestions for using the Project Resource File. (Add additional sheets as necessary.)

APPENDIX C (CONTINUED)
REPORT NO. 7
RESOURCE SURVEY

Completed by: Resource Person
Purpose: Describe services provided to students prior to the project tryout
Distribution: Gifted Science Project

CONTACT_____

_____

Directions: Please answer the following questions. Return this report to the Gifted Science Project office by using the enclosed stamped envelope. If you have a question about the information requested, call the project office at (301) 279-3500 between 8:30 a.m. and 5:00 p.m.

☐ YES
☐ NO
☐ NOT SURE

1. Did you provide help in science to an individual gifted student, in Grades 3-8, from one of these schools during the 1978 calendar year?

Montgomery County Public Schools

Argyle Junior High School	(7-8)	Piney Branch Elementary School	(4-6)
Benjamin Banneker Junior High School	(7-8)	Potomac Elementary School	(3-6)
Beverly Farms Elementary School	(3-6)	Ridgeview Junior High School	(7-8)
Cashell Elementary School	(3-6)	Tilden Junior High School	(7-8)
Cresthaven Elementary School	(3-6)	Westbrook Elementary School	(3-6)
Germantown Elementary School	(3-6)	Western Junior High School	(7-8)
Grosvenor Elementary School	(3-6)	Whetstone Elementary School	(3-6)
Mill Creek Towne Elementary School	(3-6)		

Montgomery County Catholic School

Little Flower School	(3-8)

_____ 2. If you answered YES above, indicate in the space the total number of students you helped on an individual basis. Give us your best estimate.

3. Describe below the science assistance or service you provided.

APPENDIX C (CONTINUED)
REPORT NO. 8
RESOURCE PERSON FEEDBACK

Completed by: Resource person
Purpose: Describe the student's experience with a resource
Distribution: Gifted Science Project office

CONTACT_____

Student_____ Resource File No._____

Teacher_____ School_____

Directions: Our records indicate that the student named above used you as a science resource. Please record the information below. If you need help, please call the Gifted Science Project office at 279-3500 between 8:30 a.m. and 5:00 p.m. The best time to call is between 8:30 a.m. and 12:30 p.m. when part-time clerical staff are present. Your prompt reply will be appreciated. Please return this report by using the enclosed stamped envelope.

I. Student Experiences. Nine types of student experiences are listed below. Mark the boxes for all statements which best describe the student's experiences while he/she worked with you. Briefly describe the experiences you marked.

☐ 1. The student received information through conversation, reading, or observation or was provided data.
Description:

☐ 2. The student observed objects and/or phenomena.
Description:

☐ 3. The student measured objects and/or phenomena.
Description:

☐ 4. The student formulated a hypothesis related to a problem.
Description:

☐ 5. The student designed procedures for testing a hypothesis.
Description:

☐ 6. The student carried out an activity to solve a problem or test a hypothesis.
Description:

☐ 7. The student utilized knowledge and/or skills to describe and/or construct a theoretical model.
Description:

☐ 8. The student applied newly acquired scientific knowledge to other proolems.
Description:

☐ 9. The student developed and/or used manual skills.
Description:

II. Supplementary Information. Please respond to the items below.

☐ YES
☐ NO
☐ UNCERTAIN

1. (a) Have you observed a change in science attitude, interest, motivation, or other behaviors, stated or demonstrated by the student, which you feel was directly related to his/her involvement with you?

(b) Describe your observations of this change and add comments you feel would help to describe the change.

2. Check the applicable box(es). How did the student communicate with you?

☐ Visited you at work
☐ Visited you at home
☐ Communicated by telephone
☐ Communicated in writing
☐ Communicated in some other way (Please explain)

3. _____ In the space to the left, state the total time to the nearest half-hour you spent helping this student (include telephone and written communications, and your planning time).

☐ YES
☐ NO
☐ UNCERTAIN

4. Were you adequately informed by the project staff regarding the project objectives and the procedures for your participation? (If NO, please explain below.)

5. Use this space for additional comments you wish to make.

APPENDIX D
MATCH OF PROJECT REPORTS WITH EVALUATIVE OBJECTIVES

Evaluative Objective	Report That Assesses Each Objective							
	1	2	3	4	5	6	7	8
10				X			X	
11	X		X			X		X
12				X		X		
13				X	X			
14	X	X	X	X	X	X	X	X
15	X	X	X	X	X	X		X
16			X					X
17					X	X		
18	Cost-effectiveness study; all budget data will be used.							

Adopted by the Board of Education November 22, 1978

a policy statement on

Education of Gifted and Talented Students

POLICY

I. CONDITION

The Montgomery County Board of Education has determined that instruction of gifted and talented students shall be identified as a priority area of concern and that appropriate steps shall be taken to continue to develop systemwide plans that assure provisions for the gifted and talented in each school. Students who are gifted have unique educational needs that should be met if these students are to achieve their full potential.

Montgomery County Public Schools provides a number of differentiated educational programs and or services beyond those normally provided to the general school population; however, appropriate differentiated programs and or services are not currently available for all Montgomery County Public Schools' gifted and talented students. The purpose of these programs is to assist students in realizing their contribution to themselves and to society. *(Program refers to the systematic delivery of instruction and services and includes the following components: goals and objectives, implementation plan, identification and selection procedures, curriculum and resources, staff selection and training, and evaluation.)*

Gifted and talented students are those, who by virtue of outstanding abilities, are capable of high performance. These are students who require differentiated educational programs and or services beyond those normally provided by the regular school program in order to realize their contribution to self and to society. Students capable of high performance include those with demonstrated achievement and or potential ability in any of the following areas, singly or in combination:

1. General intellectual ability
2. Specific academic aptitude
3. Creative or productive thinking
4. Leadership ability
5. Visual and performing arts
6. Psychomotor ability

Montgomery County Public Schools adopts this widely used definition and believes that gifted and talented students should be identified by professionally qualified persons. Montgomery County Public Schools has a commitment to meet the needs of gifted and talented students and to assist them in the realization of their potential.

II. PURPOSE

The purpose of this policy is to continue to ensure that Montgomery County Public Schools provide a program of appropriate qualitatively differentiated instruction K-12 and in all subject areas to meet the unique needs of gifted and talented students. The following provisions will be made as gifted and talented programs are to be developed and implemented.

1. **Identification procedures** for all Montgomery County public school students who are gifted and or talented in any one or combination of the six categories of giftedness in any subject area, K-12, will be developed, implemented, and evaluated.
2. **Curriculum and other resources** that will meet the needs of identified gifted and talented students will be identified, developed, evaluated, disseminated, and revised. These processes shall be continuous.
3. **A variety of organizational options** at the school, cluster, area, and central level, across all grades, will be developed, implemented, and systematically evaluated to provide an appropriate educational experience for identified gifted and talented students.
4. **Selection of staff** will be based upon training and experience in the education of gifted and talented students. This will include awareness and advanced skill level training to ensure qualified personnel for the gifted and talented.

III. PROCESS

The development, maintenance, and evaluation of appropriate programs for gifted and talented students will require that the superintendent:

1. Annually develop implementation and budget plans to achieve the above purposes of this policy.
2. Establish, monitor, and revise as necessary the guidelines for identifying gifted and talented students.
3. Develop curriculum materials and establish resource arrangements to provide instructional materials to meet the unique needs of gifted and talented students.
4. Establish, monitor, and disseminate information about a variety of organizational models for instruction of gifted and talented students.

5. Provide assistance and support to Montgomery County Public Schools' staff in the areas of:

a. Screening and assessment of pupils

b. Needs assessment of schools

c. Planning, developing, implementing, and evaluating programs

d. Personnel selection

e. Staff training and in-service

f. Montgomery County Public Schools' and community awareness

6. Develop and assist in implementing a comprehensive staff awareness program, as well as advanced skill level training programs, aimed at ensuring qualified personnel for the gifted and talented.

7. Systematically evaluate programs/projects.

8. Monitor programs through the Continuum Education Data Application Project.

IV. FEEDBACK

The superintendent will ensure that:

1. Programs for gifted and talented pupils will be identified in the *Directory of Alternative Programs* and *Programs for the Gifted and Talented*, as well as reflected in Montgomery County Public Schools' *Program of Studies*.

2. An annual report on the status and effectiveness of programs for gifted and talented students is submitted to the Board of Education.